Toxicology and Applied Pharmacology

An Official Journal of the Society of Toxicology

Founding Editors
Frederick Coulston
Harry W. Hays
Arnold J. Lehman

Editorial Board
Melvin E. Andersen
William D. Atchison
Linda S. Birnbaum
Kim Boekelheide
James A. Bond
Beverly Y. Cockrell
Mary E. Davis
David L. Eaton
Ernest C. Foulkes
Bruce A. Fowler
Thomas A. Gasiewicz
Robin S. Goldstein
Frederick P. Guengerich
James Halpert
Robert M. Joy
Sam Kacew
John Kao
James P. Kehrer
Debra L. Laskin
Jerold A. Last
David A. Lawrence
John J. Lech
Leland O. Loose
Michael I. Luster
Jeanne M. Manson
Charlene A. McQueen
Harihara M. Mehendale
Mary Treinen Moslen
Richard E. Peterson
Walter N. Piper
Garth Powis
Mark J. Reasor
Rudy J. Richardson
Karl Rozman
Glenn F. Rush
Jay B. Silkworth
Hugh A. Tilson
Michael A. Trush
Mary Jo Vodicnik
Michael P. Waalkes
James Leong Way
Calvin C. Willhite
Garold S. Yost

Editor
I. GLENN SIPES

Editors Emeriti
C. BOYD SHAFFER
GABRIEL L. PLAA
ROBERT A. NEAL
A. WALLACE HAYES

Associate Editors
WILLIAM O. BERNDT
JAMES S. BUS
M. GEORGE CHERIAN
A. JAY GANDOLFI
ROGENE F. HENDERSON
RICHARD D. IRONS
HERBERT E. LOWNDES
ELLEN J. O'FLAHERTY
ROBERT A. ROTH

Volume 102, 1990

ACADEMIC PRESS, INC.

San Diego New York Boston
London Sydney Tokyo Toronto

Copyright © 1990 by Academic Press, Inc.

ALL RIGHTS RESERVED

No part of this publication may be reproduced or transmitted in any form, or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per copy fee through the Copyright Clearance Center, Inc., (27 Congress Street, Salem, Massachusetts 01970), for copying beyond that permitted by Sections 107 and 108 of the U.S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works or for resale. Copy fees for pre-1990 articles are as shown on the article title pages; if no fee code appears on the title page, the copy fee is the same as for current articles.

0041-008X/90 $3.00

MADE IN THE UNITED STATES OF AMERICA

This journal is printed on acid-free paper.

CONTENTS OF VOLUME 102

NUMBER 1, JANUARY 1990

NABIL M. ELSAYED, ALYSON S. ELLINGSON, DONALD F. TIERNEY, AND MOHAMMAD G. MUSTAFA. Effects of Ozone Inhalation on Polyamine Metabolism and Tritiated Thymidine Incorporation into DNA of Rat Lungs 1

NORBERT E. KAMINSKI, DONALD W. BARNES, STEPHEN D. JORDAN, AND MICHAEL P. HOLSAPPLE. The Role of Metabolism in Carbon Tetrachloride-Mediated Immunosuppression: *In Vivo* Studies 9

H. VAN LOVEREN, E. I. KRAJNC, P. J. A. ROMBOUT, F. A. BLOMMAERT, AND J. G. VOS. Effects of Ozone, Hexachlorobenzene, and Bis(tri-*n*-butyltin)oxide on Natural Killer Activity in the Rat Lung 21

H. J. KIM, S. ODEND'HAL, AND J. V. BRUCKNER. Effect of Oral Dosing Vehicles on the Acute Hepatotoxicity of Carbon Tetrachloride in Rats 34

H. J. KIM, J. V. BRUCKNER, C. E. DALLAS, AND J. M. GALLO. Effect of Dosing Vehicles on the Pharmacokinetics of Orally Administered Carbon Tetrachloride in Rats 50

RONALD L. EVANS, S. MICHAEL OWENS, STUART RUCH, RICHARD H. KENNEDY, AND ERNST SEIFEN. The Effect of Age on Digoxin Pharmacokinetics in Fischer-344 Rats 61

JOHN M. SPITSBERGEN AND WILLIAM D. ATCHISON. Acute Alterations in Murine Neuromuscular Transmission following Exposure to a Nonparalytic Dose of Dithiobiuret 68

VEERAPOL KUKONGVIRIYAPAN, UPA KUKONGVIRIYAPAN, AND NEILL H. STACEY. Interference with Hepatocellular Substrate Uptake by 1,1,1-Trichloroethane and Tetrachloroethylene 80

ANNA-LEENA SIRÉN AND GIORA FEUERSTEIN. Cardiovascular Effects of Anatoxin-A in the Conscious Rat 91

DEBORAH C. RICE AND STEVEN G. GILBERT. Sensitive Periods for Lead-Induced Behavioral Impairment (Nonspatial Discrimination Reversal) in Monkeys 101

A. M. CUMMINGS AND S. D. PERREAULT. Methoxychlor Accelerates Embryo Transport through the Rat Reproductive Tract 110

RICHARD A. MACIA, ANTHONY C. SILVER, ROBERT A. GABEL, G. K. CAMPBELL, N. HANNA, AND M. J. DIMARTINO. Hypotension Induced by Vasopressin Antagonists in Rats: Role of Mast Cell Degranulation 117

RONALD T. RILEY, DOROTHY M. HINTON, JENCY L. SHOWKER, WILLIAM RIGSBY, AND WILLIAM P. NORRED. Chronology of Patulin-Induced Alterations in Membrane Function of Cultured Renal Cells, LLC-PK_1 128

FREDERICK W. BENZ, DONALD E. NERLAND, WILLIAM M. PIERCE, AND CHRISTINE BABIUK. Acute Acrylonitrile Toxicity: Studies on the Mechanism of the Antidotal Effect of D- and L-Cysteine and Their *N*-Acetyl Derivatives in the Rat 142

DEBORAH C. RICE AND STEVEN G. GILBERT. Effects of Developmental Exposure to Methyl Mercury on Spatial and Temporal Visual Function in Monkeys 151

GIOVANNI SANTOSTASI, R. KRISHNAN KUTTY, ANTONIO L. BARTORELLI, TAKESHI YASUMOTO, AND GOPAL KRISHNA. Maitotoxin-Induced Myocardial Cell Injury: Calcium Accumulation followed by ATP Depletion Precedes Cell Death 164

E. EDWARD BITTAR, JUDE NWOGA, AND YONG-PING HUANG. Sensitivity of the Sodium Efflux in Single Barnacle Muscle Fibers to the Microinjection of Aluminum 174

SHORT COMMUNICATIONS

LUIGI ROBBIANO, PIA CARLO, RENATA FINOLLO, AND GIOVANNI BRAMBILLA. DNA Damage Induced in Rats by Oral Administration of Chlordiazepoxide Plus Sodium Nitrite or of *N*-Nitrosochlordiazepoxide 186

LAURA CATZ-BIRO, WEI CHIN, MICHAEL C. ARCHER, MICHAEL S. POLLANEN, AND M. ANTHONY HAYES. Toxicity of *N*-Nitrosodimethylamine, *N*-Nitrosomethylbenzylamine, and 1,2-Dimethylhydrazine in Isolated Rat Hepatocytes 191

ERRATUM

Volume 101, Number 1 (1989): R. Krishnan Kutty, Yogendra Singh, Giovanni Santostasi, and Gopal Krishna, "Maitotoxin-Induced Liver Cell Death Involving Loss of Cell ATP following Influx of Calcium," pp. 1–10. 195

ANNOUNCEMENT 196

NUMBER 2, FEBRUARY 1990

CONTEMPORARY ISSUES IN TOXICOLOGY

MICHAEL F. W. FESTING. Use of Genetically Heterogeneous Rats and Mice in Toxicological Research: A Personal Perspective 197

REGULAR ARTICLES

YASUNORI FUKUSHIMA AND HIDEO KON. On the Mechanism of Loss of Deformability in Human Erythrocytes due to Heinz Body Formation: A Flow EPR Study 205

BLAKE LEE NEUBAUER, ROBIN L. GOODE, KEVIN L. BEST, KENNETH S. HIRSCH, TSUNG-MIN LIN, RICHARD P. PIOCH, KAREN S. PROBST, FRANK C. TINSLEY, AND CARL J. SHAAR. Endocrine Effects of a New Histamine H_2-Receptor Antagonist, Nizatidine (LY139037), in the Male Rat 219

FAT-CHUN T. CHANG, ROBERT E. FOSTER, EVERETTE T. BEERS, DANIEL L. RICKETT, AND MARGARET G. FILBERT. Neurophysiological Concomitants of Soman-Induced Respiratory Depression in Awake, Behaving Guinea Pigs 233

EEVA-LIISA SAINIO AND PERTTI SAINIO. Comparison of Effects of Nicotinic Acid or Tryptophan on Tryptophan 2,3-Dioxygenase in Acute and Chronic Studies 251

L. E. SENDELBACH, C. A. WHITE, S. HOWELL, Z. GREGUS, AND C. D. KLAASSEN. Effect of Sulfhydryl-Deficient Diets on Hepatic Metallothionein, Glutathione, and Adenosine 3′-Phosphate 5′-Phosphosulfate (PAPS) Levels in Rats 259

ROBERT C. LINDENSCHMIDT, KEVIN E. DRISCOLL, MARY A. PERKINS, JANET M. HIGGINS, JAMES K. MAURER, AND KATHLEEN A. BELFIORE. The Comparison of a Fibrogenic and Two Nonfibrogenic Dusts by Bronchoalveolar Lavage 268

ANNETTE T. HASTIE, HERBERT PATRICK, AND JAMES E. FISH. Inhibition and Recovery of Mammalian Respiratory Ciliary Function after Formaldehyde Exposure 282

FABRIZIO VILLANI, MILENA GALIMBERTI, ELENA MONTI, DARIO COVA, ENRICA LANZA, ANNALINDA ROZZA-DIONIGI, LUIGIA FAVALLI, AND PAOLA POGGI. Effect of ICRF-187 Pretreatment against Doxorubicin-Induced Delayed Cardiotoxicity in the Rat 292

FREDERIC Y. BOIS, LAUREN ZEISE, AND THOMAS N. TOZER. Precision and Sensitivity of Pharmacokinetic Models for Cancer Risk Assessment: Tetrachloroethylene in Mice, Rats, and Humans 300

MICHAEL F. HARE, S. MEHDI REZAZADEH, GARY P. COOPER, DANIEL J. MINNEMA, AND I. ARTHUR MICHAELSON. Effects of Inorganic Mercury on [^{3}H]Dopamine Release and Calcium Homeostasis in Rat Striatal Synaptosomes 316

JOHN B. MORRIS. First-Pass Metabolism of Inspired Ethyl Acetate in the Upper Respiratory Tracts of the F344 Rat and Syrian Hamster 331

GREGORY J. LONG, JOHN F. ROSEN, AND JOEL G. POUNDS. Cellular Lead Toxicity and Metabolism in Primary and Clonal Osteoblastic Bone Cells 346

C. D. HÉBERT, M. W. HARRIS, M. R. ELWELL, AND L. S. BIRNBAUM with the technical assistance of E. A. Haskins and J. D. Allen. Relative Toxicity and Tumor-Promoting Ability of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin (TCDD), 2,3,4,7,8-Pentachlorodibenzofuran (PCDF), and 1,2,3,4,7,8-Hexachlorodibenzofuran (HCDF) in Hairless Mice 362

SHORT COMMUNICATION

JOHN B. WATKINS III AND MARK A. PIERCE. Role of Nucleotide Pyrophosphatase in Enflurane-Induced Reduction of UDP-Glucuronic Acid Concentration in Mouse Liver .. 378

ANNOUNCEMENTS 384

NUMBER 3, MARCH 1, 1990

CONTEMPORARY ISSUES IN TOXICOLOGY

MARTIN K. JOHNSON. Organophosphates and Delayed Neuropathy—Is NTE Alive and Well? 385

REGULAR ARTICLES

CURTIS C. TRAVIS, JEFFERY L. QUILLEN, AND ANGELA D. ARMS. Pharmacokinetics of Benzene 400

RICHARD P. SOLANA, LARREL W. HARRIS, WALTER H. CARTER, JR., BRIAN G. TALBOT, RICHARD A. CARCHMAN, AND CHRIS GENNINGS. Evaluation of a Two-Drug Combination Pretreatment against Organophosphorus Exposure 421

LORI A. DOSTAL, ROBERT P. WEAVER, AND BERNARD A. SCHWETZ. Excretion of High Concentrations of Cimetidine and Ranitidine into Rat Milk and Their Effects on Milk Composition and Mammary Gland Nucleic Acid Content 430

M. A. MEDINSKY, G. SINGH, W. E. BECHTOLD, J. A. BOND, P. J. SABOURIN, L. S. BIRNBAUM, AND R. F. HENDERSON. Disposition of Three Glycol Ethers Administered in Drinking Water to Male F344/N Rats 443

PER ERIKSSON AND AGNETA NORDBERG. Effects of Two Pyrethroids, Bioallethrin and Deltamethrin, on Subpopulations of Muscarinic and Nicotinic Receptors in the Neonatal Mouse Brain 456

E. C. FOULKES AND S. BLANCK. Acute Cadmium Uptake by Rabbit Kidneys: Mechanism and Effects 464

Q. DAVID WALKER, MARK H. LEWIS, KEVIN M. CROFTON, AND RICHARD B. MAILMAN. Triadimefon, a Triazole Fungicide, Induces Stereotyped Behavior and Alters Monoamine Metabolism in Rats 474

ANDREW M. STANDEVEN, YUENIAN E. SHI, JACQUELINE F. SINCLAIR, PETER R. SINCLAIR, AND JAMES D. YAGER. Metabolism of the Liver Tumor Promoter Ethinyl Estradiol by Primary Cultures of Rat Hepatocytes 486

JEFFREY W. FISHER, TEMISTOCLES A. WHITTAKER, DOUGLAS H. TAYLOR, HARVEY J. CLEWELL III, AND MELVIN E. ANDERSEN. Physiologically Based Pharmacokinetic Modeling of the Lactating Rat and Nursing Pup: A Multiroute Exposure Model for Trichloroethylene and Its Metabolite, Trichloroacetic Acid 497

JENNIE C. C. CHANG, SHARON G. DISTLER, AND ALAN M. KAPLAN. Tobacco Smoke Suppresses T Cells but Not Antigen-Presenting Cells in the Lung-Associated Lymph Nodes 514

MICHAEL J. OLSON, JOHN T. JOHNSON, AND CHARLES A. REIDY. A Comparison of Male Rat and Human Urinary Proteins: Implications for Human Resistance to Hyaline Droplet Nephropathy 524

T. L. Sorell and J. H. Graziano. Effect of Oral Cadmium Exposure during Pregnancy on Maternal and Fetal Zinc Metabolism in the Rat 537

Tamie Nakajima, Rui-Sheng Wang, Ninzo Murayama, and Akio Sato. Three Forms of Trichloroethylene-Metabolizing Enzymes in Rat Liver Induced by Ethanol, Phenobarbital, and 3-Methylcholanthrene 546

James E. Klaunig, Randall J. Ruch, and Christopher M. Weghorst. Comparative Effects of Phenobarbital, DDT, and Lindane on Mouse Hepatocyte Gap Junctional Intercellular Communication 553

Author Index for Volume 102 564

Subject Index for Volume 102 566

Chemical Index for Volume 102 573